

1 What is claimed is

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3 1. A selectable waveguide having a first position and second  
4 position for communicating a signal between an input port and a  
5 first output port and a second output port, the selectable  
6 waveguide comprising,

7       a first waveguide section having a first waveguide shape for  
8 communicating the signal between the input port and the first  
9 output port when the selectable waveguide is in the first  
10 position, and

11      a second waveguide section having a second waveguide shape  
12 for communicating the signal between the input port and the  
13 second output port when the selectable waveguide is in the second  
14 position.

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16 2. The selectable waveguide of claim 1 wherein

17       the input port is an antenna feed port,

18       the first waveguide shape is straight between the input port  
19 and the first output port, and

20       the second waveguide shape is bent defined by a reflecting  
21 surface for reflecting the signal between input port and the  
22 second port.

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1       3. The selectable waveguide of claim 1 wherein,  
2                  the signal is communicated between an antenna feed coupled  
3                  to the input port and a first probe coupled to the first output  
4                  port through the first waveguide section when the signal is a  
5                  first polarized signal, and  
6                  the signal is communicated between an antenna feed coupled  
7                  to the input port and a second probe coupled to the second output  
8                  port through the second waveguide section when the signal is a  
9                  second polarized signal.

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12       4. The selectable waveguide of claim 1 further comprising,  
13                  a rotating element for supporting the first and second  
14                  waveguide sections, the rotating element can be rotated into the  
15                  first and second positions,  
16                  a knob for manually rotating the rotating element between  
17                  the first and second position, and  
18                  a stationary housing for supporting the rotating element.

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1       5. A selectable waveguide having a first and second position  
2 for respectively communicating first or second signals from an  
3 antenna feed to respective first and second probes, the  
4 selectable waveguide comprising,  
5           an antenna feed port coupled to the antenna feed for  
6 communicating the signals between the antenna feed and the first  
7 and second probes,  
8           a first waveguide section having a first shape and coupled  
9 to the antenna feed port for communicating the first signal,  
10          a first port coupled between the first probe and the first  
11 waveguide section for communicating the first signal between the  
12 first probe and the first waveguide section,  
13          a second waveguide section having a second shape and coupled  
14 to the antenna feed port for communicating the second signal,  
15          a second port coupled between the second probe and the  
16 second waveguide section for communicating the second signal  
17 between the second probe and the second waveguide section, and  
18          an element for supporting the first and second waveguide  
19 sections, the element having a first position for communicating  
20 the first signal between the antenna feed port through the first  
21 waveguide section to the second port, the element having a second  
22 position for communicating the second signal between the antenna  
23 feed port through the second waveguide section to the second  
24 port.

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1       6. The selectable waveguide of claim 5 wherein,  
2           the element is a rotating element,  
3           the first signal is a first polarized signal,  
4           the first waveguide shape is straight,  
5           the second signal is a second polarized signal,  
6           the second waveguide shape is bent at ninety degrees having  
7           a forty-five degree reflective surface, and  
8           the selectable waveguide is for selecting the communicating  
9           of either the first or second polarized signals, the first and  
10          second polarized signals are orthogonal to each other.

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12       7. The selectable waveguide of claim 5 wherein,  
13           the element is a rotating element,  
14           the first signal is a circularly polarized signal,  
15           the first waveguide shape is straight,  
16           the second signal is a linearly polarized signal,  
17           the second waveguide shape is bent at ninety degrees having  
18           a forty-five degree reflective surface, and  
19           the selectable waveguide is for selecting the communication  
20           of either the circularly polarized signal or the linearly  
21          polarized signal.

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1       8. The selectable waveguide of claim 5 wherein,  
2           the second signal comprises a high frequency signal and a  
3           low frequency signal,  
4           the reflective surface is a frequency selective reflective  
5           surface for reflecting low frequency signals to the second port  
6           and for passing high frequency signals to the first port,  
7           the second waveguide section comprises a waveguide extension  
8           extending from the frequency selective reflective surface and the  
9           first port for communicating the high frequency signals to the  
10          first probe through the first port when the selectable waveguide  
11          is in the second position.

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13       9. A selectable waveguide arrangement for respectively  
14          communicating first, second or third signals from an antenna feed  
15          to respective first, second and third probes, the selectable  
16          waveguide arrangement comprising a front end selectable waveguide  
17          and a back end selectable waveguide, wherein,

18           the front end selectable waveguide comprises:  
19           an antenna feed port coupled to the antenna feed for  
20          communicating the first, second and third signals between the  
21          antenna feed and the first, second and third probes;  
22           a first front end waveguide section having a first front end  
23          shape and coupled to the antenna feed port for communicating the  
24          second and third signals;

25           a first front end port coupled to back end selectable  
26          waveguide for communicating the second and third signals between  
27          the antenna feed port and the back end selectable waveguide;

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1           a second front end waveguide section having a second front  
2 end shape and coupled to the antenna feed port for communicating  
3 the first signal;

4           a second front end port coupled between the first probe and  
5 the second front end waveguide section for communicating the  
6 first signal between the antenna feed port and the first probe  
7 through the second front end waveguide section; and

8           a front end element for supporting the first front end  
9 waveguide section and the second front end waveguide section, the  
10 front end element has a first front end position for  
11 communicating the second and third signals between the antenna  
12 feed port through the first front end waveguide section through  
13 the first front end port to the back end selectable waveguide,  
14 the front end element has a second front end position for  
15 communicating the first signal between the antenna feed port  
16 through the second front end waveguide section through the second  
17 front end port to the first probe, and wherein,

18           the back end selectable waveguide comprises:

19           a back end input port coupled to the first front end port  
20 for communicating the second and third signals between the first  
21 front end port respectively to the second and third probes;

22           a first back end waveguide section having a first back end  
23 shape and coupled to the back end input port for communicating  
24 the second and third signals;

25           a first back end port coupled to the first back end  
26 waveguide section for communicating the third signal between the  
27 back end input port and the third probe through the first back  
28 end waveguide section;

1           a second back end waveguide section having a second back end  
2 shape and coupled to the back end input port for communicating  
3 the second signal;

4           a second back end port coupled between the second back end  
5 waveguide section and the second probe for communicating the  
6 second signal between the back end input port and the second  
7 probe through the second back end waveguide section; and

8           a back end element for supporting the first back end  
9 waveguide section and the second back end waveguide section, the  
10 back end element has a first back end position for communicating  
11 the third signal between the back end input port through the  
12 first back end waveguide section through the first back end port  
13 to the third probe, the back end element has a second back end  
14 position for communicating the second signal between the back end  
15 input port through the second back end waveguide section through  
16 the second back end port to the second probe.

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18 10. The selectable waveguide arrangement of claim 9 wherein,  
19           the first front end waveguide section shape is straight and  
20 uniform in cross section between the antenna feed port and the  
21 first front end port,

22           the first back end waveguide section shape is straight and  
23 uniform in cross section between the back end input port and the  
24 first back end port,

25           the second front end waveguide section shape is bent at  
26 ninety degrees having a forty-five degree reflective surface and  
27 uniform in cross section between the antenna feed port and the  
28 second front end port, and

1           the second back end waveguide section shape is bent at  
2         ninety degrees having a forty-five degree reflective surface and  
3         uniform in cross section between the back end input port and the  
4         second back end port.

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7         11. The selectable waveguide arrangement and claim 9 wherein,  
8           the first and second front end waveguide sections have a  
9         smaller cross section than the first and second back end  
10       waveguide sections.

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13         12. The selectable waveguide arrangement of claim 9 wherein the  
14         second and third signals are polarized signals and are  
15         orthogonally polarized respecting each other.

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18         13. The selectable waveguide arrangement of claim 9, wherein the  
19         first front end port is a tapered port for attenuating low  
20         frequency components of the second and third signals.

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1 14. The selectable waveguide arrangement of claim 9, wherein the  
2 third signal comprises a fourth signal and a fifth signal, the  
3 selectable waveguide arrangement is coupled to a fourth probe and  
4 a fifth probe, selectable waveguide arrangement further  
5 comprises,

6 a coupler coupled to the first front end port and comprising  
7 a fourth port and fifth port respectively coupled to the fourth  
8 and fifth probes, the fourth and fifth signals are orthogonally  
9 polarized and the fourth and fifth probes are polarization  
10 sensitive to respectively communicate the fourth and fifth  
11 signals between the antenna feed port and the fourth and fifth  
12 probes through the first front end waveguide section and fourth  
13 and fifth ports.

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